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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/551,367

11/15/2005

Akira Yamaguchi

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OLIFF & BERRIDGE, PLC
P.O. BOX 320850
ALEXANDRIA, VA 22320-4850

EXAMINER

TAKEUCHI, YOSHITOSHI

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/551,367	Applicant(s) YAMAGUCHI ET AL.	
	Examiner YOSHITOSHI TAKEUCHI	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 7, 9, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) 10-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 7, 9, 21 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 27, 2009 has been entered.
2. Claims 1, 7, 9, 21 and 22 are presented for examination under this Request for Continued Examination, wherein claims 1, 7, 9 and 21 are amended, claims 10-20 are withdrawn from consideration and claims 5 and 8 are cancelled.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because it contains 173 words. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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6. Claims 1, 7 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugimoto et al (US 5,429,846) in view of Miyazaki et al (US 6,599,463).

a. Regarding claim 1, Sugimoto teaches a ceramic slurry composition including a ceramic powder, a binder resin, a plasticizer and solvent (column 2, lines 20-29), wherein the binder resin contains a polyacetal resin (polyvinyl butyl resin) with a polymerization degree of 1700 and a butyralation degree of 65 mol% (column 17, lines 52-57), the use of 8 or 9 parts of an acetal resin to 100 parts of ceramic powder (column 13, lines 45-46; column 15, lines 31-32).

i. Sugimoto teaches the use of solvent in the ratio of 100 to 1,000 parts by weight to 100 parts by weight of ceramic powder (e.g. column 2, lines 31-32, 38-39) as set forth above, but does not specify a ratio of solvent of 20 to 80 parts by weight to 100 parts by weight of the ceramic powder.

Miyazaki teaches a monolithic ceramic electronic component and a method of manufacturing said product (abstract). Miyazaki teaches a ceramic slurry that uses 35 parts by weight to 100 parts by weight of ceramic powder. (Column 14, lines 63-43 and column 15, line 2). By using less solvent, less drying time is required and uniformity of the film surface can be controlled.

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the composition disclosed by Sugimoto, by using less solvent, as disclosed by Miyazaki, in order to reduce the drying time and to improve the uniformity of the film surface, as taught by Miyazaki (Column 14, lines 63-43 and column 15, line 2).

ii. Sugimoto teaches that the preferable organic solvent should have functional groups that enhance the affinity with the ceramic oxide (column 6, lines 3-5), wherein the solvent is a single solvent or a mixture of solvents (column 6, lines 10-11). However, Sugimoto does not specify that the solvent is at least one of terpineol, dihydroterpineol, terpinyl acetate, dihydroterpinyl acetate and 4-(1'-acetoxy-1'-) cyclohexanol acetate.

Miyazaki teaches the use of terpineol as an organic solvent (Column 11, line 27) for use with ceramic pastes (abstract).

iii. Sugimoto teaches a ceramic slurry where the ceramic powder consists of 0.5 to 48 wt% of the entire slurry, where the ratio of solvent by weight to ceramic powder by weight is 1,000:100 to 100:100 (C_f 30 to 55 wt%, where the ratio of solvent by weight to ceramic powder by weight is 80:100 to 20:100).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have selected the overlapping portion of the ranges disclosed by the reference, for similar ratios of solvent to ceramic powder, because overlapping ranges have been held to be a prima facie case of obviousness. In re Malagari, 182 USPQ 549 (CCPA, 1974). See also MPEP § 2144.05(I).

iv. Sugimoto teaches viscosities within the range of 20 to 270 centipoises, but does not teach the claimed viscosity of 4 to 30 Pa-s at a shear rate of 8 [1/s].

However, Sugimoto teaches that the viscosity should be adjusted according to its intended use. (Column 1, lines 46-59). “[W]here the general

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conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F.2d 454, 456 (CCPA 1955). See also MPEP § 2144.05 (II). In this case, Sugimoto does not specify the claimed viscosity of 4 to 30 Pa-s at a shear rate of 8 [1/s], but it does describe the general conditions of the claim, namely viscosities within the range of 20 to 270 centipoises range and also that the viscosity should be adjusted according to its intended use. It would not be inventive to discover the workable ranges by routine experimentation of the invention taught by Sugimoto.

v. Sugimoto does not teach a ceramic slurry where the plasticizer contained is 20 to 200 parts by weight with respect to 100 parts by weight of a binder resin. However, Miyazaki teaches the use of dioctyl phthalate as a plasticizer in the ratio of 3 parts by weight to 7 parts by weight of polyvinyl butyral. (Column 15, lines 48-50).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have selected the range of plasticizer disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness. In re Malagari, 182 USPQ 549 (CCPA. 1974). See also MPEP § 2144.05 (I).

b. Regarding claims **7** and **21**, Sugimoto in view of Miyazaki teaches the ceramic slurry of claim 1, but does not teach a ceramic slurry that contains at least one of phthalate ester, dibutyl phthalate (DBP), dioctyl phthalate (DOP), benzylbutyl phthalate (BBP), butyl butylene glycol (BPBG), adipic acid ester, diethylene adipic acid (DOA),

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sebacic acid ester, or sebacic dibutyl as a plasticizer. However, Miyazaki teaches the use of a phthalate ester (dioctyl phthalate) as a plasticizer, which improves the flowability of the ceramic and reduces waste resulting from delamination or micro-cracking. (Column 15, lines 48-49).

It would have been obvious to one having ordinary skill in the art at the time of the invention to use a plasticizer, such as dioctyl phthalate, as taught by Miyazaki, in the ceramic slurry of Sugimoto in view of Miyazaki, in order to increase the flowability of the ceramic and reduce waste (Column 15, lines 48-49).

7. Claims 9 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugimoto et al (US 5,429,846), in view of Miyazaki et al (US 6,599,463) and further in view of Suzuki et al (JP 2002-313672).

Regarding claims **9** and **22**, Sugimoto in view of Miyazaki teaches the ceramic slurry of claim 1. However, Sugimoto in view of Miyazaki does not specify using at least one of a hygroscopic polymer, cation based surfactant (amine based surfactant) and amphoteric surfactant as an antistatic agent.

Suzuki teaches that static electricity becomes a strong influence in exfoliating the ceramic green sheet from the base material, especially for sheets less than 3 microns thick. (Detailed Description section, paragraph 0018). Suzuki teaches using an antistatic agent such as trimethylammonium salt (Detailed Description section, paragraph 0034) to prevent damage to a ceramic green sheet, which is less than 3 microns thick, during exfoliation from a base material. (Detailed Description section, paragraph 0018).

It would have been obvious to one having ordinary skill in the art at the time of the invention to use in the ceramic slurry of Sugimoto in view of Miyazaki as an antistatic agent in print paste sheets that are less than 3 microns thick, as disclosed by Suzuki, in order to reduce defects caused during exfoliation from the base material, as taught by Suzuki (Detailed Description section, paragraph 0018).

Response to Arguments

8. Applicant's arguments filed January 28, 2009 have been fully considered but they are not persuasive. The applicant made the following arguments, which were rebutted in the Advisory Action dated February 13, 2009 and reproduced *infra* for ease of reference.

a. First, the applicant argues that Sugimoto in view of Miyazaki fails to teach each and every feature of the claimed paste.

In response, the applicants fail to meet the burden of providing evidence supporting their allegations that the references do not read on claim 1, per the discussion *infra*.

b. Secondly, the applicants argue Miyazaki is directed to a conductive past rather than a ceramic paste.

In response, a ceramic paste can also be conductive.

c. Third, the applicants argue that the ceramic paste of Miyazaki requires significantly more solvent than the claimed paste.

In response, as stated in the Final action, Sugimoto teaches a paste overlapping the claimed solvent concentration. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references

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individually where the rejections are based on combinations of references. See In re Keller, 642 F.2d 413 (CCPA 1981); In re Merck & Co., 800 F.2d 1091 (Fed. Cir. 1986).

d. Fourth, the applicants argue Sugimoto does not teach the claimed viscosity range of 4 to 30 Pa-s at a shear rate of 8 [l/s] and that within prescribed ranges, the "hanging paste" has preferred physical characteristics at the edge.

In response, Sugimoto teaches the range and also teaches that the concentration of solvent should be adjusted for the intended use. It was well known in the art that optimizing the viscosity for certain materials' surface tension determines whether a fluid forms a clean interface or not

e. Fifth, the applicants traverse the restriction requirement.

In response, the examiner maintains that the restriction requirement is proper in view of the reasons provided supra in this Office action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOSHITOSHI TAKEUCHI whose telephone number is (571) 270-5828. The examiner can normally be reached on Monday-Thursday 9:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit
1793

/YOSHITOSHI TAKEUCHI/
Examiner, Art Unit 1793